A Guide to Waste Audits and Reduction Workplans for Industrial, Commercial and Institutional Sectors

As Required Under Ontario Regulation 102/94.

Ontario

Ministry of Environment and Energy

To obtain copies of this or other guides to the 3Rs Regulations, telephone, write or fax:

3Rs Regulations
Ministry of Environment and Energy
135 St. Clair Avenue West, 2nd floor
Toronto, Ontario M4V 1P5

Tel: 1-800-565-4923
(416) 323-4321
Fax: (416) 323-4564

The ministry welcomes comments on the guides. Please submit them to the above address.

Questions regarding the regulations should be directed to the ministry's Waste Reduction Office in Toronto at (416) 325-4440, or to a Ministry of Environment and Energy Regional or District Office listed in Appendix A.

Copies of Regulation 102/94 are available from Publications Ontario at 1-800-668-9938 or 326-5300 in Toronto.

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ERRATA

Please note the following corrections in the sample **Waste Reduction Workplan Summary** on page 50 of the guide, *Waste Audits and Workplans for the Industrial, Commercial and Institutional Sectors.*

In the **Waste Reduction Workplan Summary** on page 50 of the guide, in the column entitled weight of waste material (tonnes) the figures should be amended to: cardboard, 11.2 tonnes; finepaper, 20.6 tonnes; newsprint, 4.4 tonnes; aluminum, 0.6 tonnes; ferrous, 2.7 tonnes; and glass, 1.7 tonnes. In the column entitled Projections - Reduction, a figure should be amended, glass, 1.0 tonnes and in the Recycling column the figures should be amended to: newsprint, 4.0 tonnes; aluminum, 0.5 tonnes; ferrous, 2.5 tonnes; and glass 0.6 tonnes.

Pibs 2480 - 01

PREFACE

This guide is one of a series to help waste generators, packagers, municipalities and recycling site operators understand and comply with the requirements of the 3Rs Regulations that became law March 3, 1994.

The regulations are an integral part of Ontario's Waste Reduction Action Plan, announced in February 1991 by the Minister of Environment and Energy. The plan is aimed at reducing the amount of waste going to disposal by at least 50 per cent by the year 2000 compared to the base year of 1987.

Ontario will achieve this goal with a strategy based on the 3Rs — reduction, reuse and recycling.

The 3Rs Regulations are designed to ensure that industrial, commercial and institutional (IC&I) sectors, as well as municipalities, develop programs to reduce the amount of valuable resources going to disposal.

The five new regulations, made under the *Environmental Protection Act*, are:

Ontario Regulation 101/94: Recycling and Composting of Municipal Waste
Ontario Regulation 102/94: Waste Audits and Waste Reduction Workplans
Ontario Regulation 103/94: Industrial, Commercial and Institutional Source Separation Programs
Ontario Regulation 104/94: Packaging Audits and Packaging Reduction Workplans
Ontario Regulation 105/94: Definitions (Amendments to Regulation 347)

This guide will help designated IC&I sectors comply with requirements for conducting waste audits and preparing and implementing waste reduction workplans as required under Regulation 102/94. For a legal interpretation of requirements, refer to the Official Regulation.

The other guides in this series are:

- *A Guide to Source Separation of Recyclable Materials and Leaf and Yard Waste Systems for Municipalities as Required Under Ontario Regulation 101/94*
- *A Guide to Source Separation of Recyclable Materials for Industrial, Commercial and Institutional Sectors and Multi-Unit Residential Buildings as Required under Ontario Regulation 103/94*
- *A Guide to Approvals for Recycling Sites, Leaf and Yard Waste Composting Sites and Compost Use as Required under Ontario Regulation 101/94*
- *A Guide to Waste Audits and Reduction Workplans for Construction and Demolition Projects as Required under Ontario Regulation 102/94*
- *A Guide to Packaging Audits and Reduction Workplans as Required under Ontario Regulation 104/94*

Ontario's Waste Reduction Target

The Government of Ontario has established a target to decrease the amount of waste going to disposal by at least 50 per cent by the year 2000 compared to the base year of 1987. This is a *provincial* target that applies to the total amount of non-hazardous solid waste generated in Ontario from all sources. While this target is not a legal requirement for individual municipalities and IC&I establishments under the 3Rs Regulations, many have voluntarily adopted it, and some have set an even higher waste reduction target.

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1.0 INTRODUCTION

The 3Rs Regulations apply to all non-hazardous solid wastes from residential and industrial, commercial and institutional (IC&I) sources. This guide focuses on the requirements for waste audits and workplans for designated IC&I establishments.

The preparation and implementation of the IC&I waste audits and waste reduction workplans by those designated under Regulation 102/94 will contribute significantly toward the provincial waste reduction goal.

IC&I wastes make up the largest component of the non-hazardous solid waste stream. Efforts to reduce the IC&I waste stream will, therefore, have the greatest potential for diverting materials away from disposal into productive use.

Waste audits and waste reduction workplans can also help reduce the residential waste stream. Changes in the manufacturing process, for example, identified by a waste audit, can lead to design changes in the product ultimately bought by consumers. The design changes may incorporate the 3Rs hierarchy by reducing material use and by making the product more reusable or recyclable.

Chapter 1.0 of this guide provides compliance deadlines for the completion of waste audits and workplans under Regulation 102/94. Chapter 2.0 describes the general requirements of a waste reduction program. Chapter 3.0 defines the sectors that must implement a waste reduction program and any special provisions which apply to the individual sectors.

The appendices list information sources on waste audits and reduction workplans and sample forms required for recording purposes. Appendix E contains information on a typical waste audit process and checklists for conducting waste audits and preparing waste reduction workplans.

1.1 Compliance Deadlines

Designated establishments must have a complete waste audit and waste reduction workplan available within six months of becoming subject to the regulation:

- An existing establishment that was over the size threshold on March 3, 1994, the date Regulation 102/94 came into effect, must comply no later than September 3, 1994.
- An establishment that comes into existence after March 3, 1994, and is above the size threshold, will have six months to comply.
- An establishment that increases its size above the size threshold on a date after March 3, 1994, will have six months to comply.

2.0 GENERAL REQUIREMENTS

There are four basic steps to implementing a waste reduction program required under Regulation 102/94:

1. Conducting a waste audit
2. Developing a waste reduction workplan
3. Implementing the waste reduction workplan
4. Updating the audit and workplan

This chapter outlines the general requirements for these components and the reporting process.

2.1 Conducting a Waste Audit

A waste audit is essentially a study of wastes generated by an establishment. Regulation 102/94 is intended to ensure that a comprehensive approach to the study of waste is taken by the designated IC&I waste generators. The audit must go beyond measuring the quantity of waste and identifying its composition, to identifying the underlying reasons and operational factors for waste generation.

Under the regulation, all waste audits must address:

- the amount, nature and composition of the waste generated in all functional areas of an establishment;
- how the waste is produced, including relevant management policies and practices; and
- how the waste is managed.

An owner or operator responsible for more than one designated establishment may conduct a single audit for a representative establishment if it is reasonable to expect that the results of separate audits would be similar. For example, a school board could conduct one audit for all similar schools under its jurisdiction and use the results of the single audit as the basis for developing a waste reduction workplan for each school subject to the regulation.

2.2 Developing a Waste Reduction Workplan

The information from the waste audit is the basis for developing the waste reduction workplan. The workplan addresses 3Rs opportunities to be implemented.

Regulation 102/94 requires that all completed waste reduction workplans must include all reasonable actions that can be taken. These actions must follow the 3Rs hierarchy, with reduction as first priority, followed by reuse, and then recycling.

2.3 Implementing a Waste Reduction Workplan

A waste reduction workplan must assign responsibilities and resources for implementation. It must also provide timelines for implementation and expected results. A workplan may be structured so that some actions are given a higher priority than others. An owner or operator will need to determine which actions will contribute the most toward the established waste reduction objectives.

2.4 Updating the Audit and Workplan

Regulation 102/94 requires that the owner or operator of a designated establishment have in place a continuing waste reduction program which makes the 3Rs a routine part of operations or doing business.

Regulation 102/94 requires that all waste audits and waste reduction workplans be updated at least once a year. This will ensure that the audit and workplan are reasonably up-to-date. A business that experiences rapid growth or significant change in production processes, however, may need to update its audit and workplan on a more frequent basis.

It is sufficient for a new owner or operator of a designated establishment to update a waste audit or waste reduction workplan conducted by a previous owner or operator.

2.5 Processing and Reporting Requirements

A waste audit and waste reduction workplan must be documented in written reports. The requirements for these reports are described below. Any additional requirements for each type of establishment are described in Chapter 3.0.

- A waste reduction workplan must set out who will implement each part of the plan, when each part will be implemented and the expected results.
- A report of a waste audit or a waste reduction workplan must be on a form provided by the ministry or in the same format. Sample completed forms are found in Appendix E of this guide. A blank form is included at the end of the guide; additional forms are available from the ministry's Regional and District Offices. In most cases a waste audit or waste reduction workplan will include much more extensive documentation than the summary information required on these forms.
- A report of a waste audit and reduction workplan must be retained on file for at least five years.
- The waste reduction workplan or a summary of the workplan must be posted in places where employees will see it. An employee must be allowed to see the workplan on request.
- The owner or operator of a designated establishment must submit the most recent audit and workplan within seven days to the ministry, when requested by a ministry Director.
- A waste audit must address the extent to which materials or products used by the owner consist of recycled or reused materials or products.
- A waste reduction workplan must deal with the wastes generated by the operation of the designated establishment.

3.0 WHO IS AFFECTED / SPECIAL PROVISIONS

Requirements for designated IC&I establishments to prepare waste audits and waste reduction workplans apply to associated administrative, warehousing or other ancillary activities/departments located on site.

> IC&I waste generators designated under Regulation 102/94 are also required to establish a source separation program under Regulation 103/94. See *A Guide to Source Separation of Recyclable Materials for Industrial, Commercial and Institutional Sectors and Multi-Unit Residential Buildings.*

3.1 Educational Institutions

An "educational institution" is designated and must implement a waste audit program if more than 350 persons are enrolled at the location or campus of the institution at any time during the calendar year. There is no distinction between part-time and full-time students.

This definition covers both public or private institutions, including: elementary, secondary and vocational schools; training academies; and colleges and universities. Also included in this category are any facilities that are used predominantly for education, such as a company's employee training institute. Recreational centres, such as summer youth camps with an incidental training component, are not included in this category.

3.2 Hospitals

A "public hospital" is designated if it is a group A, B or F hospital in Regulation 964 of the Revised Regulations of Ontario, 1990.

Regulation 964 classifies these hospitals as:

Group A: General hospitals with teaching facilities for university medical students, as evidenced by a written agreement between the hospital and the university with which it is affiliated; hospitals approved in writing by the Royal College of Physicians and Surgeons for providing post-graduate eduction leading to certification or a fellowship in one or more of the specialties recognized by the College.

Group B: General hospitals having at least 100 beds.

Group F: Hospitals for chronic patients and having at least 200 beds.

See Appendix B for a full listing of the hospitals covered under Group A, B or F.

Nursing homes or homes for the aged, which are not covered by the *Public Hospitals Act,* are not subject to the regulation.

3.3 Hotels or Motels

A "hotel or motel" is designated and must implement a waste audit program if it has more than 75 units.

This definition covers facilities with sleeping accommodations for temporary stays, including motels, hotels, inns, resorts, hostels, or other buildings providing temporary lodging to the travelling public. A vacation cabin is defined as a single unit, but reserved locations at camp grounds and trailer parks are not.

3.4 Manufacturing Establishments

A "large manufacturing establishment" is designated and must implement a waste audit program if employees at the site work in excess of 16,000 hours in any one calendar month during the preceding two calendar years.

- For establishments operational on March 3, 1994, when the regulation came into force, the employees must have worked more than 16,000 hours in any month in 1992 or 1993 for the regulation to apply.
- For establishments which come into existence after the regulation came into force, or where the hours worked was under the 16,000-hour threshold at the time the regulation came into force, the regulation will apply in the first calendar year following a calendar month in which employees worked more that 16,000 hours.

A designated manufacturing establishment is no longer subject to the regulation if for every month in two successive calendar years employees work less than a total of 16,000 hours. The ministry may request that the owner supply proof within seven days to the Director or be automatically subject to the regulation. Copies of the records related to hours of employment under Section 11 of the *Employment Standards Act* are sufficient proof.

An "owner" is the operator of the manufacturing establishment; not a landlord leasing facilities to a manufacturer.

The requirements for manufacturing establishments apply to a "site". This would include nearby properties owned or leased by the same person where passage from one property to another involves crossing, but not travelling along, a public highway. All facilities or buildings at the same site are included in the calculation of hours worked.

> The Standard Industrial Classification (SIC) system issued by Statistics Canada is a useful framework to help determine whether or not your manufacturing establishment is subject to this regulation. Appendix C lists industries from Division E of the SIC codes which are considered manufacturing for purposes of this regulation. The mining, forestry, agricultural and crude petroleum and gas industries are not included.

3.5 Office Buildings

An "office building" is designated and must implement a waste audit program if it has at least 10,000 square metres of floor area for use as offices.

This definition covers buildings or groups of buildings that are used primarily for administrative business purposes. Examples are buildings with government offices, company headquarters, financial and investment offices, and where other professional services are conducted.

Groups of buildings means two or more buildings which have the same owner and are located at the same site. There can be one building or property, excluding public roads or lands, of a different ownership located between any two buildings in the group.

Floor area is defined as the area devoted to offices. For instance, if some of the floor area is used for parking, laboratory or residential uses, it should not be included. It is calculated as "gross area" according to the *Ontario Building Code*: "the total area of all floors above grade measured between the outside surfaces of exterior walls, or between the outside surfaces of exterior walls and the centre line of firewalls, except that, in any other occupancy than a residential occupancy, where an access or a building service penetrates a firewall, measurements shall not be taken to the centre line of such firewall."

The owner of the office building is responsible for a waste audit and workplan for waste generated at the building. The owner needs to include tenants' activities only insofar as they impact waste management services of the owner. Internal practices and policies of tenants need not be included in the audit.

3.6 Restaurants

All owners of restaurants, including take out restaurants, are designated and must implement a waste audit program if gross sales for all restaurants operated by the owner in Ontario were $3 million or more in any of the two preceeding calendar years.

- For restaurants that were operational on March 3, 1994, when the regulation came into force, the sales must have been more than $3 million in 1992 or 1993 for the regulation to apply.
- For restaurants which come into existence or increase above the sales criteria after March 3, 1994, the regulation will apply in the first calendar year following the calendar year in which gross sales were $3 million or more.

Note that the ministry may request that the owner supply proof within seven days to the Director or be automatically subject to the regulation. Copies of records related to purchase and sale maintained under subsection 5(1) of Regulation 1013 of Revised Regulations of Ontario, 1990 are sufficient proof.

A designated restaurant owner is no longer subject to the regulation when two calendar years pass in which the gross sales in each year were less than $3 million.

Restaurants are defined as establishments that prepare food or beverages on site and offer them for immediate sale to the public. Preparation may include cooking, baking, filling or packaging into servable portions. This category includes licensed and unlicensed restaurants, pubs, taverns and cafeterias that provide sit-down meals, take-out, pick-up or delivery.

If the restaurant is in a designated retail shopping establishment or complex, office building, hotel or motel, hospital or campus of an educational institution, and the owner co-operates in the waste audit and reduction program of these establishments, then the owner of the restaurant is not subject to the regulation.

For example, in the case of a restaurant located on the ground floor of a 20,000 square metre office building, the restaurant owner is not designated under the regulation. However, the restaurant must participate in the building owner's waste audit and waste reduction program.

If a restaurant is located in a building which is not designated, the owner of the restaurant is responsible for complying with the regulation if the owner meets the sales criteria.

3.7 Retail Shopping Establishments

A "retail shopping establishment" is designated and must implement a waste audit program if its floor area is at least 10,000 square metres (see section 3.5, Office Buildings, for calculating floor area). Parking areas are not included in floor area.

Also, retail shopping establishments, regardless of size, are designated if they are part of a designated retail shopping complex (see section 3.8, below) whose owner is not responsible for the waste from the establishment.

A retail shopping establishment is a location where goods or services are sold at retail to persons who come to the establishment.

The audit must address the recycled content of materials and products used and sold by the owner.

3.8 Retail Shopping Complexes

A "retail shopping complex" is designated and must implement a waste audit program if the total floor area of the establishments in the complex is at least 10,000 square metres (see section 3.5, Office Buildings, for calculating floor area).

This definition includes a group of "retail shopping establishments" that are planned, developed and designed as a unit, including department stores, strip malls, plazas, indoor shopping malls or centres, supermarkets, department stores and gallerias.

The waste audit need not cover waste from establishments for which the owner does not provide waste management services.

APPENDIX A

Ministry of Environment and Energy – Regional and District Offices

Central Region

Halton - Peel District Office
1235 Trafalgar Road, #401
Oakville, ON L6H 3P1
Tel. #: (905) 844-5747
Fax #: (905) 842-1750

Toronto Regional and York - Durham District Offices
7 Overlea Blvd., 4th Floor
Toronto, ON M4H 1A8
Tel. #: (416) 424-3000
Fax #: (416) 325-6345

West Central

Cambridge District Office
P.O. Box 219
320 Pinebush Road
Cambridge, ON N1R 5T8
Tel. #: (519) 622-8121
Fax #: (519) 622-3119

Hamilton District Office
Box 2112
119 King St. West, 12th floor
Hamilton, ON L8N 3Z9
Tel. #: (905) 521-7650
Fax #: (905) 521-7806

Welland District Office
637-641 Niagara Street North
Welland, ON L3C 1L9
Tel. #: (905) 384-9845
Fax #: (905) 735-0574

Mid-Ontario Region

Barrie District Office
54 Cedar Point Drive, Unit 1203
Barrie, ON L4N 5R7
Tel. #: (705) 726-1730
Fax #: (705) 726-5100

Muskoka Haliburton District Office
483 Bethune Drive
Gravenhurst, ON P0C 1G0
Tel. #: (705) 687-6647
Fax #: (705) 687-3715

North Bay District Office
Northgate Plaza
1500 Fisher Street
North Bay, ON P1B 2H3
Tel. #: (705) 476-1001
Fax #: (705) 476-0207

Sudbury District Office
199 Larch Street, ~~11th Floor~~
Sudbury, ON P3E 5P9
Tel. #: (705) 675-4501
Fax #: (705) 675-4180

Southeastern Region

Belleville District Office
470 Dundas Street East
Belleville, ON K6H 1C1
Tel. #: (613) 962-9208
Fax #: (613) 962-6809

Cornwall District Office
205 Amelia Street
Cornwall, ON K6H 3P3
Tel. #: (613) 933-7402
Fax #: (613) 933-6402

Kingston District Office
133 Dalton Street
Kingston, ON K7K 6C2
Tel. #: (613) 549-4000
Fax #: (613 548-6920

Ottawa District Office
2435 Holly Lane
Ottawa, ON K1V 7P2
Tel. #: (613) 521-3450
Fax # (613) 521-5437

Peterborough District Office
1477 Lansdowne Street West
Peterborough, ON K9J 7M3
Tel. #: (705) 743-2972
Fax #: (705) 748-4192

Southwestern Region

London Regional Office
985 Adelaide Street South
London, ON N6E 1V3
Tel. #: (519) 661-2200
Fax #: (519) 661-1742

Owen Sound District Office
1180 - 20th Street East
Owen Sound, ON N4K 6H6
Tel. #: (519) 371-2901
Fax #: (519) 371-2905

Sarnia Area Office
265 Front Street North, #109
Sarnia, ON N7T 7X1
Tel. #: (519) 336-4030
Fax #: (519) 336-4280

Windsor District Office
250 Windsor Avenue, 6th floor
Windsor, ON N6A 6V9
Tel. #: (519) 254-2546
Fax #: (519) 254-5894

Northern Region

Kenora District Office
P.O. Box 5150
808 Robertson Street
Kenora, ON P9N 1X9
Tel. #: (807) 468-2718
Fax #: (807) 468-2735

Sault Ste. Marie District Office
747 Queen Street
Sault Ste. Marie, ON P6A 2A8
Tel. #: (705) 949-4640
Fax #: (705) 945-6868

Thunder Bay Regional Office
P.O. Box 5000
435 James Street South, 3rd Floor
Thunder Bay, ON P7C 5G6
Tel. #: (807) 475-1205
Fax #: (807) 475-1754

Timmins District Office
83 Algonquin Blvd. West
Timmins, ON P4N 2R4
Tel. #: (705) 268-3222
Fax #: (705) 264-7336

APPENDIX B

Group A, B, and F hospitals, as defined under Ontario Regulation 964, are as follows

GROUP A HOSPITALS

(a) Group A hospitals being general hospitals providing facilities for giving instruction to medical students of any university, as evidenced by a written agreement between the hospital and the university with which it is affiliated, and hospitals approved in writing by the Royal College of Physicians and Surgeons for providing post-graduate education leading to certification or a fellowship in one or more of the specialties recognized by the Royal College of Physicians and Surgeons

Item	*Location*	*Name*
1.	Hamilton	Chedoke-McMaster Hospitals
2.	Hamilton	Hamilton Civic Hospital
3.	Hamilton	St. Joseph's Hospital
4.	Kingston	Hôtel Dieu Hospital
5.	Kingston	Kingston General Hospital
6.	London	St. Joseph's Health Centre of London
7.	London	University Hospital
8.	London	Victoria Hospital
9.	Ottawa	Children's Hospital of Eastern Ontario
10.	Ottawa	Ottawa Civic Hospital
11.	Ottawa	Ottawa General Hospital
12.	Toronto	The Hospital For Sick Children
13.	Toronto	Mount Sinai Hospital
14.	Toronto	St. Joseph's Health Centre
15.	Toronto	St. Michael's Hospital
16.	Toronto	Sunnybrook Hospital
17.	Toronto	The Wellesley Hospital
18.	Toronto	Toronto East General and Orthopaedic Hospital
19.	Toronto	The Toronto Hospital
20.	Toronto	Women's College Hospital
21.	Willowdale	North York General Hospital

GROUP B HOSPITALS

(b) Group B hospitals, being general hospitals having not fewer than 100 beds

Item	*Location*	*Name*
1.	Ajax	Ajax and Pickering General Hospital
2.	Barrie	Royal Victoria Hospital
3.	Belleville	Belleville General Hospital
4.	Brampton	Peel Memorial Hospital
5.	Brantford	The Brantford General Hospital
6.	Brantford	St. Joseph's Hospital
7.	Brockville	Brockville General Hospital
8.	Burlington	Joseph Brant Memorial Hospital
9.	Cambridge	Cambridge Memorial Hospital
10.	Chatham	Public General Hospital
11.	Chatham	St. Joseph's Hospital
12.	Cobourg	Cobourg District General Hospital
13.	Collingwood	General and Marine Hospital
14.	Cornwall	Cornwall General Hospital
15.	Cornwall	Hôtel Dieu Hospital
16.	Downsview	York-Finch General Hospital
17.	Elliot Lake	St. Joseph's General Hospital
18.	Etobicoke	The Etobicoke General Hospital
19.	Fort Frances	Rainy River Valley Health Care Facilities Inc.
20.	Guelph	Guelph General Hospital
21.	Guelph	St. Joseph's Hospital
22.	Hawkesbury	Hawkesbury and District General Hospital
23.	Huntsville	Huntsville District General
24.	Kenora	Lake of the Woods District Hospital
25.	Kirkland Lake	Kirkland and District Hospital
26.	Kitchener	Kitchener-Waterloo Hospital
27.	Kitchener	St. Mary's General Hospital
28.	Leamington	Leamington District Memorial Hospital
29.	Lindsay	Ross Memorial Hospital
30.	Markham	Markham Stouville Hospital
31.	Midland	Huronia District Hospital
32.	Milton	Milton District Hospital
33.	Mississauga	Credit Valley Hospital
34.	Mississauga	The Mississauga Hospital
35.	New Liskeard	Temiskaming Hospital

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Item	Location	Name
36.	Newmarket	York County Hospital
37.	Niagra Falls	The Greater Niagara General Hospital
38.	North Bay	North Bay Civic Hospital
39.	North Bay	North Bay and District Health Centre
40.	North Bay	St. Joseph's General Hospital of North Bay Inc.
41.	Oakville	Oakville-Trafalgar Memorial Hospital
42.	Orangeville	Dufferin Area Hospital
43.	Orillia	Orillia Soldiers' Memorial Hospital
44.	Oshawa	Oshawa General Hospital
45.	Ottawa	Hôpital Montford
46.	Ottawa	Queensway-Carleton Hospital
47.	Ottawa	Riverside Hospital
48.	Ottawa	The Salvation Army Grace Hospital
49.	Owen Sound	Grey Bruce Regional Health Centre
50.	Pembroke	Pembroke General Hospital
51.	Pembroke	Pembroke Civic Hospital
52.	Peterborough	The Peterborough Civic Hospital
53.	Peterborough	St. Joseph's General Hospital
54.	Port Colbourne	Port Colbourne General Hospital
55.	Richmond Hill	York Central Hospital
56.	St. Catherines	Hôtel Dieu Hospital
57.	St. Catherines	The St. Catherines General Hospital
58.	St. Thomas	St. Thomas-Elgin General Hospital
59.	Sarnia	St. Joseph's Health Care of Sarnia Inc.
60.	Sarnia	Sarnia General Hospital
61.	Sault St. Marie	General Hospital
62.	Sault St. Marie	Plummer Memorial Public Hospital
63.	Scarborough	The Salvation Army Scarborough Grace Hospital
64.	Scarborough	Centenary Hospital
65.	Scarborough	Scarborough General Hospital
66.	Simcoe	Norfolk General Hospital
67.	Smiths Falls	The Smiths Falls Community Hospital
68.	Stratford	Stratford General Hospital
69.	Strathroy	Strathroy Middlesex General Hospital
70.	Sudbury	Laurentian Hospital
71.	Sudbury	Sudbury General Hospital of Immaculate Heart of Mary
72.	Sudbury	Sudbury Memorial Hospital
73.	Thunder Bay	The General Hospital of Port Arthur
74.	Thunder Bay	McKellar General Hospital
75.	Thunder Bay	St. Joseph's General Hospital
76.	Tillsonburg	Tillsonburg District Memorial Hospital
77.	Timmins	St. Mary's General Hospital
78.	Timmins	District Hospital
79.	Toronto	Central Hospital
80.	Toronto	The Doctors Hospital
81.	Toronto	Northwestern General Hospital
82.	Toronto	Orthopaedic and Arthritic Hospital
83.	Toronto	Queensway General Hospital
84.	Trenton	Trenton Memorial Hospital
85.	Welland	Welland County General Hospital
86.	Weston	Humber Memorial Hospital
87.	Willowdale	North York Branson Hospital
88.	Winchester	Winchester District Memorial Hospital
89.	Windsor	Hôtel Dieu of St. Joseph's
90.	Windsor	Metropolitan General Hospital
91.	Windsor	Salvation Army Grace Hospital
92.	Windsor	Windsor Western Hospital Centre, Inc.
93.	Woodstock	Woodstock General Hospital

GROUP F HOSPITALS

(f) Group F hospitals, being hospitals for chronic patients and having not fewer than 200 beds

Item	Location	Name
1.	Hamilton	St. Peter's Hospital
2.	London	Parkwood Hospital
3.	Ottawa	Elizabeth Bruyere
4.	Ottawa	The Perley Hospital
5.	Ottawa	St. Vincent Hospital
6.	Scarborough	Providence Hospital
7.	Thunder Bay	Hogarth-Westmount Hospital
8.	Toronto	Baycrest Hospital
9.	Toronto	The Queen Elizabeth Hospital (Dunn Avenue Division) (University Avenue Division)
10.	Toronto	Riverdale Hospital
11.	Toronto	St. Joseph's Health Centre (Chronic Care Unit)
12.	Toronto	West Park Hospital
13.	Windsor	Windsor Western Hospital Centre Inc.

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APPENDIX C

Standard Industrial Classification (SIC) Codes

DIVISIONS, MAJOR GROUPS, INDUSTRY GROUPS AND INDUSTRY CLASSES

DIVISION E - MANUFACTURING INDUSTRIES

MAJOR GROUP 10 - FOOD INDUSTRIES

101 - Meat and Poultry Products Industries
- 1011 Meat and Meat Products Industry (Except Poultry)
- 1012 Poultry Products Industry

102 - Fish Products Industry
- 1021 Fish Products Industry

103 - Fruit and Vegetable Industries
- 1031 Canned and Preserved Fruit and Vegetable Industry
- 1032 Frozen Fruit and Vegetable Industry

104 - Dairy Products Industries
- 1041 Fluid Milk Industry
- 1049 Other Dairy Products Industries

105 - Flour, Prepared Cereal Food and Feed Industries
- 1051 Cereal Grain Flour Industry
- 1052 Prepared Flour Mixes and Prepared Cereal Foods Industry
- 1053 Feed Industry

106 - Vegetable Oil Mills (Except Corn Oil)
- 1061 Vegetable Oil Mills (Except Corn Oil)

107 - Bakery Products Industries
- 1071 Biscuit Industry
- 1072 Bread and Other Bakery Products Industry

108 - Sugar and Sugar Confectionery Industries
- 1081 Cane and Beet Sugar Industry
- 1082 Chewing Gum Industry
- 1083 Sugar and Chocolate Confectionery Industry

109 - Other Food Products Industries
- 1091 Tea and Coffee Industry
- 1092 Dry Pasta Products Industry
- 1093 Potato Chip, Pretzel and Popcorn Industry
- 1094 Malt and Malt Flour Industry
- 1099 Other Food Products Industries n.e.c.

MAJOR GROUP 11 - BEVERAGE INDUSTRIES

111 - Soft Drink Industry
- 1111 Soft Drink Industry

112 - Distillery Products Industry
- 1121 Distillery Products Industry

113 - Brewery Products Industry
- 1131 Brewery Products Industry

114 - Wine Industry
- 1141 Wine Industry

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DIVISIONS, MAJOR GROUPS, INDUSTRY GROUPS AND INDUSTRY CLASSES

MAJOR GROUP 12 - TOBACCO PRODUCTS INDUSTRIES

121 - Leaf Tobacco Industry
- 1211 Leaf Tobacco Industry

122 - Tobacco Products Industry
- 1221 Tobacco Products Industry

MAJOR GROUP 15 - RUBBER PRODUCTS INDUSTRIES

151 - Tire and Tube Industry
- 1511 Tire and Tube Industry

152 - Rubber Hose and Belting Industry
- 1521 Rubber Hose and Belting Industry

159 - Other Rubber Products Industries
- 1599 Other Rubber Products Industries

MAJOR GROUP 16 - PLASTIC PRODUCTS INDUSTRIES

161 - Foamed and Expanded Plastic Products Industry
- 1611 Foamed and Expanded Plastic Products Industry

162 - Plastic Pipe and Pipe Fittings Industry
- 1621 Plastic Pipe and Pipe Fittings Industry

163 - Plastic Film and Sheeting Industry
- 1631 Plastic Film and Sheeting Industry

169 - Other Plastic Products Industries
- 1691 Plastic Bag Industry
- 1699 Other Plastic Products Industries n.e.c.

MAJOR GROUP 17 - LEATHER AND ALLIED PRODUCTS INDUSTRIES

171 - Leather and Allied Products Industries
- 1711 Leather Tanneries
- 1712 Footwear Industry
- 1713 Luggage, Purse and Handbag Industry
- 1719 Other Leather and Allied Products Industries

MAJOR GROUP 18 - PRIMARY TEXTILE INDUSTRIES

181 - Man-Made Fibre and Filament Yarn Industry
- 1811 Man-Made Fibre and Filament Yarn Industry

182 - Spun Yarn and Woven Cloth Industries
- 1821 Wool Yarn and Woven Cloth Industry
- 1829 Other Spun Yarn and Woven Cloth Industries

183 - Broad Knitted Fabric Industry
- 1831 Broad Knitted Fabric Industry

MAJOR GROUP 19 - TEXTILE PRODUCTS INDUSTRIES

191 - Natural Fibres Processing and Felt Products Industry
- 1911 Natural Fibres Processing and Felt Products Industry

192 - Carpet, Mat and Rug Industry
- 1921 Carpet, Mat and Rug Industry

193 - Canvas and Related Products Industry
- 1931 Canvas and Related Products Industry

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199 - Other Textile Products Industries
- 1991 Narrow Fabric Industry
- 1992 Contract Textile Dyeing and Finishing Industry
- 1993 Household Products of Textile Materials Industry
- 1994 Hygiene Products of Textile Materials Industry
- 1995 Tire Cord Fabric Industry
- 1999 Other Textile Products Industries n.e.c.

MAJOR GROUP 24 - CLOTHING INDUSTRIES

243 - Men's and Boys' Clothing Industries
- 2431 Men's and Boys' Coat Industry
- 2432 Men's and Boys' Suit and Jacket Industry
- 2433 Men's and Boys' Pants Industry
- 2434 Men's and Boys' Shirt and Underwear Industry
- 2435 Men's and Boys' Clothing Contractors

244 - Women's Clothing Industries
- 2441 Women's Coat and Jacket Industry
- 2442 Women's Sportswear Industry
- 2443 Women's Dress Industry
- 2444 Women's Blouse and Shirt Industry
- 2445 Women's Clothing Contractors

245 - Children's Clothing Industry
- 2451 Children's Clothing Industry

249 - Other Clothing and Apparel Industries
- 2491 Sweater Industry
- 2492 Occupational Clothing Industry
- 2493 Glove Industry
- 2494 Hosiery Industry
- 2495 Fur Goods Industry
- 2496 Foundation Garment Industry
- 2499 Other Clothing and Apparel Industries n.e.c.

MAJOR GROUP 25 - WOOD INDUSTRIES

251 - Sawmill, Planing Mill and Shingle Mill Products Industries
- 2511 Shingle and Shake Industry
- 2512 Sawmill and Planing Mill Products Industry (Except Shingles and Shakes)

252 - Veneer and Plywood Industries
- 2521 Hardwood Veneer and Plywood Industry
- 2522 Softwood Veneer and Plywood Industry

254 - Sash, Door and Other Millwork Industries
- 2541 Prefabricated Wooden Buildings Industry
- 2542 Wooden Kitchen Cabinet and Bathroom Vanity Industry
- 2543 Wooden Door and Window Industry
- 2549 Other Millwork Industries

256 - Wooden Box and Pallet Industry
- 2561 Wooden Box and Pallet Industry

258 - Coffin and Casket Industry
- 2581 Coffin and Casket Industry

259 - Other Wood Industries
- 2591 Wood Preservation Industry
- 2592 Particle Board Industry
- 2593 Wafer Board Industry
- 2599 Other Wood Industries n.e.c.

MAJOR GROUP 26 - FURNITURE AND FIXTURE INDUSTRIES

261 - Household Furniture Industries
- 2611 Wooden Household Furniture Industry
- 2612 Upholstered Household Furniture Industry
- 2619 Other Household Furniture Industries

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DIVISIONS, MAJOR GROUPS, INDUSTRY GROUPS AND INDUSTRY CLASSES

264 - Office Furniture Industries
- 2641 Metal Office Furniture Industry
- 2649 Other Office Furniture Industries

269 - Other Furniture and Fixture Industries
- 2691 Bed Spring and Mattress Industry
- 2692 Hotel, Restaurant and Institutional Furniture and Fixture Industry
- 2699 Other Furniture and Fixture Industries n.e.c.

MAJOR GROUP 27 - PAPER AND ALLIED PRODUCTS INDUSTRIES

271 - Pulp and Paper Industries
- 2711 Pulp Industry
- 2712 Newsprint Industry
- 2713 Paperboard Industry
- 2714 Building Board Industry
- 2719 Other Paper Industries

272 - Asphalt Roofing Industry
- 2721 Asphalt Roofing Industry

273 - Paper Box and Bag Industries
- 2731 Folding Carton and Set-Up Box Industry
- 2732 Corrugated Box Industry
- 2733 Paper Bag Industry

279 - Other Converted Paper Products Industries
- 2791 Coated and Treated Paper Industry
- 2792 Stationery Paper Products Industry
- 2793 Paper Consumer Products Industry
- 2799 Other Converted Paper Products Industries n.e.c.

MAJOR GROUP 28 - PRINTING, PUBLISHING AND ALLIED INDUSTRIES

281 - Commercial Printing Industries
- 2811 Business Forms Printing Industry
- 2819 Other Commercial Printing Industries

282 - Platemaking, Typesetting and Bindery Industry
- 2821 Platemaking, Typesetting and Bindery Industry

283 - Publishing Industries
- 2831 Book Publishing Industry
- 2839 Other Publishing Industries

284 - Combined Publishing and Printing Industries
- 2841 Newspaper, Magazine and Periodical (Combined Publishing and Printing) Industry
- 2849 Other Combined Publishing and Printing Industries

MAJOR GROUP 29 - PRIMARY METAL INDUSTRIES

291 - Primary Steel Industries
- 2911 Ferro-alloys Industry
- 2912 Steel Foundries
- 2919 Other Primary Steel Industries

292 - Steel Pipe and Tube Industry
- 2921 Steel Pipe and Tube Industry

294 - Iron Foundries
- 2941 Iron Foundries

295 - Non-Ferrous Metal Smelting and Refining Industries
- 2951 Primary Production of Aluminum Industry
- 2959 Other Primary Smelting and Refining of Non-Ferrous Metal Industries

296 - Aluminum Rolling, Casting and Extruding Industry
- 2961 Aluminum Rolling, Casting and Extruding Industry

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DIVISIONS, MAJOR GROUPS, INDUSTRY GROUPS AND INDUSTRY CLASSES

297 - Copper and Copper Alloy Rolling, Casting and Extruding Industry
- 2971 Copper and Copper Alloy Rolling, Casting and Extruding Industry

299 - Other Rolled, Cast and Extruded Non-Ferrous Metal Products Industries
- 2999 Other Rolled, Cast and Extruded Non-Ferrous Metal Products Industries

MAJOR GROUP 30 - FABRICATED METAL PRODUCTS INDUSTRIES (EXCEPT MACHINERY AND TRANSPORTATION EQUIPMENT INDUSTRIES)

301 - Power Boiler and Heat Exchanger Industry
- 3011 Power Boiler and Heat Exchanger Industry

302 - Fabricated Structural Metal Products Industries
- 3021 Metal Tanks (Heavy Gauge) Industry
- 3022 Plate Work Industry
- 3023 Pre-Engineered Metal Buildings Industry (Except Portable)
- 3029 Other Fabricated Structural Metal Products Industries

303 - Ornamental and Architectural Metal Products Industries
- 3031 Metal Door and Window Industry
- 3032 Prefabricated Portable Metal Buildings Industry
- 3039 Other Ornamental and Architectural Metal Products Industries

304 - Stamped, Pressed and Coated Metal Products Industries
- 3041 Custom Coating of Metal Products Industry
- 3042 Metal Closure and Container Industry
- 3049 Other Stamped and Pressed Metal Products Industries

305 - Wire and Wire Products Industries
- 3051 Upholstery and Coil Spring Industry
- 3052 Wire and Wire Rope Industry
- 3053 Industrial Fastener Industry
- 3059 Other Wire Products Industries

306 - Hardware, Tool and Cutlery Industries
- 3061 Basic Hardware Industry
- 3062 Metal Dies, Moulds and Patterns Industry
- 3063 Hand Tool and Implement Industry
- 3069 Other Hardware and Cutlery Industries

307 - Heating Equipment Industry
- 3071 Heating Equipment Industry

308 - Machine Shop Industry
- 3081 Machine Shop Industry

309 - Other Metal Fabricating Industries
- 3091 Metal Plumbing Fixtures and Fittings Industry
- 3092 Metal Valve Industry
- 3099 Other Metal Fabricating Industries n.e.c.

MAJOR GROUP 31 - MACHINERY INDUSTRIES (EXCEPT ELECTRICAL MACHINERY)

311 - Agricultural Implement Industry
- 3111 Agricultural Implement Industry

312 - Commercial Refrigeration and Air Conditioning Equipment Industry
- 3121 Commercial Refrigeration and Air Conditioning Equipment Industry

319 - Other Machinery and Equipment Industries
- 3191 Compressor, Pump and Industrial Fan Industry
- 3192 Construction and Mining Machinery and Materials Handling Equipment Industry

3193 Sawmill and Woodworking Machinery Industry
3194 Turbine and Mechanical Power Transmission Equipment Industry
3199 Other Machinery and Equipment Industries n.e.c.

MAJOR GROUP 32 - TRANSPORTATION EQUIPMENT INDUSTRIES

321 - Aircraft and Aircraft Parts Industry
3211 Aircraft and Aircraft Parts Industry

323 - Motor Vehicle Industry
3231 Motor Vehicle Industry

324 - Truck and Bus Body and Trailer Industries
3241 Truck and Bus Body Industry
3242 Commercial Trailer Industry
3243 Non-Commercial Trailer Industry
3244 Mobile Home Industry

325 - Motor Vehicle Parts and Accessories Industries
3251 Motor Vehicle Engine and Engine Parts Industry
3252 Motor Vehicle Wiring Assemblies Industry
3253 Motor Vehicle Stampings Industry
3254 Motor Vehicle Steering and Suspension Parts Industry
3255 Motor Vehicle Wheel and Brake Industry
3256 Plastic Parts and Accessories For Motor Vehicles Industry
3257 Motor Vehicle Fabric Accessories Industry
3259 Other Motor Vehicle Accessories, Parts and Assemblies Industries

326 - Railroad Rolling Stock Industry
3261 Railroad Rolling Stock Industry

327 - Shipbuilding and Repair Industry
3271 Shipbuilding and Repair Industry

328 - Boatbuilding and Repair Industry
3281 Boatbuilding and Repair Industry

329 - Other Transportation Equipment Industries
3299 Other Transportation Equipment Industries

MAJOR GROUP 33 - ELECTRICAL AND ELECTRONIC PRODUCTS INDUSTRIES

331 - Small Electrical Appliance Industry
3311 Small Electrical Appliance Industry

332 - Major Appliance Industry (Electric and Non-Electric)
3321 Major Appliance Industry (Electric and Non-Electric)

333 - Electric Lighting Industries
3331 Lighting Fixture Industry
3332 Electric Lamp and Shade Industry (Except Bulb and Tube)
3333 Electric Lamp (Bulb and Tube) Industry

334 - Record Player, Radio and Television Receiver Industry
3341 Record Player, Radio and Television Receiver Industry

335 - Communication and Other Electronic Equipment Industries
3351 Telecommunication Equipment Industry
3352 Electronic Parts and Components Industry
3359 Other Communication and Electronic Equipment Industries

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DIVISIONS, MAJOR GROUPS, INDUSTRY GROUPS AND INDUSTRY CLASSES

336 - Office, Store and Business Machine Industries
- 3361 Electronic Computing and Peripheral Equipment Industry
- 3362 Electronic Office, Store and Business Machine Industry
- 3369 Other Office, Store and Business Machine Industries

337 - Electrical Industrial Equipment Industries
- 3371 Electrical Transformer Industry
- 3372 Electrical Switchgear and Protective Equipment Industry
- 3379 Other Electrical Industrial Equipment Industries

338 - Communications and Energy Wire and Cable Industry
- 3381 Communications and Energy Wire and Cable Industry

339 - Other Electrical Products Industries
- 3391 Battery Industry
- 3392 Non-Current Carrying Wiring Devices Industry
- 3399 Other Electrical Products Industries n.e.c.

MAJOR GROUP 35 - NON-METALLIC MINERAL PRODUCTS INDUSTRIES

351 - Clay Products Industries
- 3511 Clay Products Industry (From Domestic Clay)
- 3512 Clay Products Industry (From Imported Clay)

352 - Hydraulic Cement Industry
- 3521 Hydraulic Cement Industry

354 - Concrete Products Industries
- 3541 Concrete Pipe Industry
- 3542 Structural Concrete Products Industry
- 3549 Other Concrete Products Industries

355 - Ready-Mix Concrete Industry
- 3551 Ready-Mix Concrete Industry

356 - Glass and Glass Products Industries
- 3561 Primary Glass and Glass Containers Industry
- 3562 Glass Products Industry (Except Glass Containers)

357 - Abrasives Industry
- 3571 Abrasives Industry

358 - Lime Industry
- 3581 Lime Industry

359 - Other Non-Metallic Mineral Products Industries
- 3591 Refractories Industry
- 3592 Asbestos Products Industry
- 3593 Gypsum Products Industry
- 3594 Non-Metallic Mineral Insulating Materials Industry
- 3599 Other Non-Metallic Mineral Products Industries n.e.c.

MAJOR GROUP 36 - REFINED PETROLEUM AND COAL PRODUCTS INDUSTRIES

361 - Refined Petroleum Industries
- 3611 Refined Petroleum Products Industry (Except Lubricating Oil and Grease)
- 3612 Lubricating Oil and Grease Industry

369 - Other Petroleum and Coal Products Industries
- 3699 Other Petroleum and Coal Products Industries

DIVISIONS, MAJOR GROUPS, INDUSTRY GROUPS AND INDUSTRY CLASSES

MAJOR GROUP 37 - CHEMICAL AND CHEMICAL PRODUCTS INDUSTRIES

371 - Industrial Chemicals Industries n.e.c.
- 3711 Industrial Inorganic Chemical Industries n.e.c.
- 3712 Industrial Organic Chemical Industries n.e.c.

372 - Agricultural Chemical Industries
- 3721 Chemical Fertilizer and Fertilizer Materials Industry
- 3722 Mixed Fertilizer Industry
- 3729 Other Agricultural Chemical Industries

373 - Plastic and Synthetic Resin Industry
- 3731 Plastic and Synthetic Resin Industry

374 - Pharmaceutical and Medicine Industry
- 3741 Pharmaceutical and Medicine Industry

375 - Paint and Varnish Industry
- 3751 Paint and Varnish Industry

376 - Soap and Cleaning Compounds Industry
- 3761 Soap and Cleaning Compounds Industry

377 - Toilet Preparations Industry
- 3771 Toilet Preparations Industry

379 - Other Chemical Products Industries
- 3791 Printing Ink Industry
- 3792 Adhesives Industry
- 3799 Other Chemical Products Industries n.e.c.

MAJOR GROUP 39 - OTHER MANUFACTURING INDUSTRIES

391 - Scientific and Professional Equipment Industries
- 3911 Indicating, Recording and Controlling Instruments Industry
- 3912 Other Instruments and Related Products Industry
- 3913 Clock and Watch Industry
- 3914 Ophthalmic Goods Industry

392 - Jewellery and Precious Metal Industries
- 3921 Jewellery and Silverware Industry
- 3922 Precious Metal Secondary Refining Industry

393 - Sporting Goods and Toy Industries
- 3931 Sporting Goods Industry
- 3932 Toys and Games Industry

397 - Sign and Display Industry
- 3971 Sign and Display Industry

399 - Other Manufactured Products Industries
- 3991 Broom, Brush and Mop Industry
- 3992 Button, Buckle and Clothes Fastener Industry
- 3993 Floor Tile, Linoleum and Coated Fabric Industry
- 3994 Musical Instrument and Sound Recording Industry
- 3999 Other Manufactured Products Industries n.e.c.

APPENDIX D - ADDITIONAL SOURCES OF INFORMATION

Key Sources of Information

Recycling Council of Ontario (RCO) – A leading source of 3Rs information in the province. The RCO offers a waste reduction information service that includes 'how to' information on waste audits and reduction workplans, and a database and library with a comprehensive list of waste management information. (416) 960-0938 or 1-800-263-2849.

Association of Municipal Recycling Coordinators – Facilitates the sharing of waste reduction information and experiences among municipalities. (519) 823-1900

Canadian Waste Materials Exchange – Publishes the Canadian Waste Materials Exchange Bulletin, a listing of wastes available, wastes wanted, and transportation and reprocessing services available. (416) 822-4111 (ext. 265)

Ontario Waste Exchange – A hotline that will match a waste materials producer with a potential user. Diane Lawson (416) 822-4111 (ext. 656)

Consultants – Waste Reduction Consultants Directory (Fee: $5.00 plus GST & PST) available through the RCO.

Municipal contacts – Municipal Program Directory (Fee: $30.00 plus GST & PST) or Recycling Operators Directory (Fee: $5.00 plus GST & PST) available through the RCO.

Waste Reduction Guides and Audits

Association of Municipal Recycling Coordinators (AMRC):
(519) 823-1990 or Fax: (519) 823-0084
Waste Reduction Action Plan (IC&I) – Volume 1: (Industrial, Commercial, Institutional Solid Waste Assessment Guide)
This guide is intended for use by municipal recycling coordinators in the IC&I sector as an aid in the completion of a solid waste audit. This volume is the first of two; the second will deal with development and implementing an action plan. This guide is currently under revision. There is no charge to members of AMRC. A charge will apply to non-members.

Canadian Polystyrene Recycling Association: (416) 612-8290
Polystyrene Recycling Handbook
A step by step guide to starting a polystyrene recycling program, by identifying specific types of polystyrene materials that can be recycled, calculating the amount of polystyrene to be collected, choosing appropriate equipment and materials and contacting the association's recycling facility in Mississauga.

Canadian Restaurant and Foodservices Association:
Education Department (416) 923-8416, or 1-800-387-5649
Going Green Without Seeing Red
A practical guide for foodservice operators. Topics covered — design and implementation of an environmental program and ways to get staff and customers involved.

Environment Canada: (819) 997-2800
Working Your Way to a Green Office
A publication available in both English and French that shows how to start a waste reduction program and general environmental change in the workplace.

Greater Toronto Home Builders Association:
Government Affairs Department - (416) 391-3445
Can also contact: Canada Housing and Mortgage Corporation - (613) 748-2367 or Fax: (613) 748-4069.
Making a Molehill out of a Mountain II – (Implementing the 3Rs in residential construction.)
This booklet, aimed at the building industry, centres around three primary concepts: reducing waste at source; reusing what would normally be landfilled; and recycling materials for which there is no immediate reuse. It assists contractors in performing waste audits and then developing plans of action.

Harmony Foundation of Canada: (613) 230-7353 or Fax: (613) 230-5399
Workplace Guide, Practical Action for the Environment
A comprehensive guide for all types of businesses and institutions wanting to implement an extensive environmental program in their organization. Topics covered include: energy, waste, purchasing, transportation, and property management.

Management Board Secretariat: (416) 327-3777
Maximum Green Guide
Developed by the Ontario government's Green Workplace Program, this 'how to' guide details the development of a 3Rs program in the workplace.

Ontario Ministry of Environment and Energy:
1-800-565-4923 or in Toronto at 323-4321
Hospital Waste Audit Manual (PIBS 1905 EO1) and Companion Document: The First Step Towards Waste Reduction, Reuse and Recycling (PIBS 1905 EO2)
Comprehensive manuals on identifying hospital waste and 3Rs opportunities prepared for the Ottawa General Hospital in April 1992 by ORTECH International with funding from the Ontario Ministry of Environment and Energy and Environment Canada.

Ontario Public School Boards Association: (416) 340-2540
The Trash Tally
This handbook and accompanying video are intended to assist schools with carrying out waste audits and with developing, implementing and monitoring waste reduction workplans.

Orr & Boss: (519) 542-1415
Towards Zero Waste – (101 Waste - busting tips!)
This handy booklet provides industry with the methods to reduce waste and improve productivity. Individual sections deal with machinery, blending, papermaking, chemical, paint and ink, and lamination, conversion and printing processes.

Paton and Royal Communications Ltd.: (416) 503-4576
Initiating Corporate Environmental Responsibility – (Your Company's Guide to Improving Profitability and Helping the Environment)
An environmental resource directory for services, products and programs useful for implementing environmentally sound changes in the workplace. This guide was developed for the *National Business Show, 1991.*

Creating the Green Office of the Future Today
A brief guide outlining environmentally responsible design, constructions and operations for companies. Included are examples of successful initiatives undertaken by companies to make their operations more efficient and less wasteful. This guide was presented at *"Business and the Environment"* a feature of the *National Business Show, 1992.*

Pitney Bowes:
(1-800-465-3777, or Fax 1-800-461-3777, or contact the RCO)
The Office Guide to Waste Reduction and Recycling
A step-by-step guide to implementing waste reduction and recycling programs in the office. Produced by Pitney Bowes in conjunction with the Recycling Council of Ontario.

The Pitney Bowes Green Office Guide - Moving Beyond Waste Reduction and Recycling
This is a more advanced guidebook for office workers who want to go beyond the basics of recycling and reduction. It develops new ideas in areas such as environmentally conscious office habits and sound purchasing decisions.

Recycling Council of Ontario: (416) 960-0938, or 1-800-263-2849
Ontario Recycling Resourcebook: How to comply with the 3Rs Regs.
Includes directories of markets, consultants and municipal recycling contacts, legislation and a step-by-step guide for complying with the audit requirements of the 3Rs Regulations.

Toronto Recycling Action Committee (TRAC): (416) 392-7850
A Guide to Low Waste Meetings, Conventions and Conferences
A guide to assist in developing meetings, or events that will produce little, or no waste.

Additional Reading

50 Simple Things Your Business Can Do to Save the Earth
Earthworks Press, Berkeley, California. 1991.

Save the Earth at Work
The Bennett Information Group. Bob Adams, Inc., Holbrook, Mass. 1991.

Green is Gold
Patrick Carson & Julia Moulden. Harper Collins Publishers, Toronto. 1991

Business Recycling Manual
Inform, Inc., New York. 1991.

The National Waste Reduction Handbook
National Round Table on the Environment and the Economy, Ottawa. 1991.

Audio Visual

Videos on a variety of waste management issues are available — contact the Recycling Council of Ontario for more information.

APPENDIX E - A TYPICAL WASTE REDUCTION PROGRAM

Getting Started: Ensuring Strong Direction

Ideally, your waste audit/reduction workplan program should be managed by a person who is interested in resource conservation. The person you choose to be your Waste Reduction Coordinator will need good communication skills, organizational ability, and basic mathematics, as well as sound knowledge and experience of your operations. An effective Waste Reduction Coordinator will have the greatest impact when fully involved in all aspects of the waste audit and reduction workplan program.

In addition, you may wish to form a Waste Reduction Committee to set up and maintain your waste reduction program. The committee could consist of the coordinator, department representatives, and staff.

The committee will ensure that detailed knowledge about your facility will be incorporated into the critical preparation stage of the program. Also, making information available to all departments in your facility builds a stronger awareness of your waste reduction plans.

Obtaining Administration and Staff Commitment

Ideally, the Waste Reduction Coordinator/Committee should develop broad waste reduction objectives as quickly as possible. These objectives should be reviewed by senior management to ensure that funds are available to carry out the program and to ensure management commitment. Examples of what role(s) the Coordinator/Committee could play to successfully undertake a waste audit and to implement a waste reduction workplan include the following:

- identifying and interpreting government requirements and regulations;
- securing senior management support;
- conducting and/or overseeing the waste audit;
- establishing the waste reduction goals;
- identifying funding requirements and the costs and benefits of the program;
- developing a 3Rs program and implementation schedule;
- monitoring the waste reduction, reuse, and recycling activities; and
- promoting and communicating waste reduction activities.

Communicating Project Objectives

Before initiating a waste audit or reduction workplan, it's a good idea to inform all staff and department heads of the objectives of the program and the importance of their cooperation to its success.

CONDUCTING A WASTE AUDIT

Introduction

An important factor in planning your waste audit is the level of audit detail you choose to use. The level of detail depends upon the size of the facility, complexity of operations, and the accuracy you require for your reduction workplan.

The waste audit process outlined in this section of the guide is one approach that will provide you with enough information to proceed with your waste reduction workplan and to meet the requirements of the Ministry of Environment and Energy.

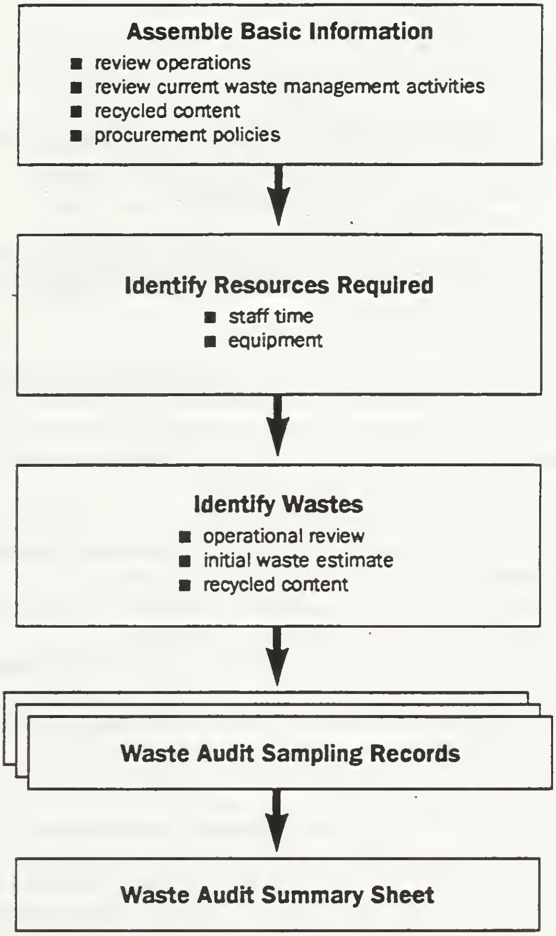
This approach is not intended to provide a highly accurate and detailed measurement of all waste, but to identify the major wastes and to provide a starting point for your waste diversion initiatives. Figure 1, Waste Audit Flowchart, provides an overview of the audit process. More detailed and "how to" information sources are listed in Appendix D.

You may be able to develop your initial waste audit information without actually performing a waste audit if you have:

- carried out a waste audit and/or waste reduction initiatives prior to the introduction of the requirements in the regulation; or
- waste audit data from a similar facility for which you are also responsible.

You will be able to review the previous or similar audit data and identify operational differences. You can then make any changes needed to apply the information to your facility.

Figure 1: Waste Audit Flowchart



Step 1: Assemble Basic Information

Review Operations

Your Waste Reduction Coordinator/Committee should review and record the following basic information about your operations:

- **number of employees, students, building area or floor area, or other indicators relevant to your type of establishment;**
- **site location and size, if applicable;**
- **type of establishment;**
- **internal activities, for example; office space, cafeteria(s), maintenance, commercial industrial and groundskeeping; and**
- **purchasing policies.**

It is important to review all of your operations, so that you will not miss future opportunities for waste reduction. The scope of the review will include the traditional waste generation areas. This level of review, with waste reduction in mind, often leads to significant opportunities. Here are the minimum points to review:

- **composition and quantity of all wastes directly generated within the establishment through all normal activities;**
- **the extent to which materials or products used or sold consist of recycled or reused materials or products;**
- **the manner by which the waste is generated including management decisions and policies that relate to the production of waste; and**
- **administrative, maintenance, and other procedures used within the establishment.**

Review Existing Waste Reduction and Disposal Activities

At this early point in the audit program, your Coordinator/Committee should also review your current waste management activities. The review will provide start-up information for your waste audit and for later efforts in waste reduction planning.

Basic questions to be asked relate to:

- **current waste separation and recycling activities;**
- **timing and frequency of existing waste collections;**
- **methods of waste collection currently employed, including internal and external waste handling;**
- **quantities of waste and recyclables collected;**
- **waste collection contractor/recycling service contractor;**
- **person responsible for waste management;**
- **gross costs of waste collection and disposal;**
- **date of most recent waste audit; and**
- **obtain an up-to-date list of recycling facilities and capabilities in your area.**

Step 2: Identify Resource Requirements

Before starting the waste audit, an estimate should be made of the resources required to carry out the project. If resources are limited, or the operation is a highly complex one, you may want to consider hiring consultants specializing in waste audits. Figure 2, Resource Requirements Checklist, gives a sample format to document the resource requirements. You may need to use one of these checklists for each operating area of your establishment.

Your resource requirements may include the following:

- **adequate time for assigned people to carry out audit tasks to ensure the quality of your audit data;**
- **storage containers to isolate, move, and sort waste and recyclables;**
- **different-colour bags, tags, or labelled containers to identify wastes from various generation points;**
- **space for sorting and storing wastes during the audit;**
- **a weigh scale.**

Step 3: Identify Wastes

The objective of this step is to identify types of wastes and places where they are being generated. During the review, you should note existing collection and storage practices and any other special considerations that should be taken into account later when you develop your waste reduction workplan.

Figure 2: Resource Requirements Checklist

Project/Site Location: 1 ABC Street Material Office Tower		Planned Date: 01/02/3456			Space Required: 10 cu.m.			
Audit Step Description	Staff Required				Equipment Required			
	Name/Position	# of Staff	Req. From	Req. To	Type	Quantity	From	To
Identify audit Resources Requirements + Verify Availability	Coordinator	1	DAY 1	DAY 3				
Initial Waste Estimating -Planning -Design -Sampling -Analysis	Coordinator	1	DAY 4		Scale	1	DAY 4	
					Gloves	5		
					Tables	2		
					Bins/ Bags	100		DAY 34
	Sorters	4		DAY 34				
Estimating Total Annual Waste Quanities	Coordinator	1	DAY 35					
Recycled Content of Materials Purchased	Coordinator	1	DAY 5					
	Purchaser	3		DAY 8				
Waste Audit Reporting	Coordinator	1	Day 37					

If a standard audit is available which similarly describes your waste management practise, then you may use the standard audit (check with your association or one of the sources listed in Appendix D). However, it is still your responsibility to ensure that the information that appears in the audit reflects the waste generated at your establishment.

Sources of information that will help you to identify the different types of waste may include:

- **material purchasing records;**
- **waste disposal invoices; and**
- **records of waste produced at generation points in daily operations.**

You can identify your wastes by:

- **noting the types of waste generated by each operation within your facility (i.e., maintenance, food service, groundskeeping, production, research etc.);**
- **conducting a walk-through review of operations to ensure that all waste streams have been identified. Look inside waste containers, and, above all, ask questions.**

Classify your wastes as follows:

- **materials that the Ministry of Environment and Energy will require you to source separate for recycling (see *A Guide to Source Separation of Recyclable Materials for Industrial, Commercial and Institutional Sectors and Multi-Unit Residential Buildings*);**
- **other materials identified within your operation that could be source-separated for recycling, reduction, or reuse initiatives;**
- **residual material now going for disposal.**

Step 4: Estimate Waste

It is now necessary to estimate how much of each of the three types of waste materials identified above that your operation generates during a specific period. Estimates of waste by weight, can be obtained from records or from sample observations carried out at various times during the audit. By studying the samples taken and considering details such as seasonal fluctuations or other changes in your activities, you can estimate annual waste generation quantities.

If you are unable to obtain such weight-based information from your waste hauler and/or recycler, try estimating volume by sizing garbage dumpsters or recycling containers and then using appropriate conversion

factors. (A list of acceptable conversion factors is provided in Appendix F.) The formula below allows you to estimate the weight of recyclables. It can also be used for estimating the weight of garbage, based on the appropriate bulk density figure.

Formula for Estimating Weight of Waste

Volume per month	=	# of containers	X	Volume per container (Note: bins may vary in size)	X	# of times containers emptied during audit period	X	Average % of container filled
Bulk Density (from conversion factor)			=			X kg/cubic yard		
Weight per month	=	Volume/ per month	X	Bulk Density	=	kg/ month		

Example: Estimating Weight of Recyclable Glass/Bottles

Five 2-cu-yd. containers of glass bottles are collected four times during an audit period of one month. The containers are 90% full at time of collection.

Volume of glass collected monthly = 5 x 2 x 4 x 90% = 36 cubic yards

The bulk density of glass bottles is 300 kg/cubic yard (from Appendix F). Therefore, the weight of glass bottles collected monthly = 36 x 300 = 10800 kg (or 10.8 tonnes)

Example: Estimating Weight of Garbage

Two 10-cu-yd dumpsters of garbage are collected eight times during an audit period of one month. The dumpsters are 90% full at time of collection.

Volume of garbage = 2 x 10 x 8 x 90% = 144 cubic yards

Bulk density of garbage equals 200 kg/cubic yards. Therefore, the weight of garbage collected monthly = 144 x 200 = 28,800 kg. (or 28.8 tonnes).

Therefore, in this example total weight of source-separated glass and garbage for a one-month period equals: 10.8 tonnes + 28.8 tonnes = 39.6 tonnes

If your operation is not yet source-separating either Ministry-required materials or other materials, you should determine the weights of your materials by sampling a portion of your waste. This would involve sorting and weighing the waste generated over the sample period, according to the categories identified. The sample period may be as short as one day, or longer in most cases, if fluctuations in waste generation are expected.

Sources for additional information on performing this type of sampling is available in Appendix D.

Once you have isolated your waste sample you should:

- **weigh the sample;**
- **identify the types of waste within the sample;**
- **sort the various components of the sample into containers;**
- **determine the weights of the components by weighing each component separately or by using conversion factors based on the volume of the sample;**
- **factor the results of the sample to estimate annual waste generation totals.**

Step 5: Identify Recycled Content

Up to this point, you will have assessed the composition, volumes and weights of wastes generated by all your operations.

Your Coordinator/Committee should now examine purchasing specifications to identify the post-consumer recycled content of purchased products, packaging and raw materials. "Post consumer" material comes from previously used business or consumer products, such as newspapers, plastic bottles, glass containers or aluminum cans. "Pre-consumer" material, in contrast, is basically manufacturing waste. For example, a paper manufacturer might recycle the clippings left over from trimming paper. These clippings are put back into the process instead of being thrown away. Determining whether you can take steps to increase either the use of items with higher recycled content, or allow you to reuse materials directly on site will be useful.

It will not be necessary to examine 100 per cent of your incoming materials. A common approach is to combine the individual purchases of similar materials and to list them in descending order of purchase value. It is usually found that the first 20 per cent or so of the listed materials

account for 80 per cent or more of the total purchase value (and potential waste). This means that you may need to examine only 20 per cent of the material types to obtain most of the information you need.

Note that owners of an office building or retail shopping complex should address recycled content only of the materials or products they use, not those of tenants.

Looking at the major material purchases, you can quickly review the recycled content of each material. Approach your supplier immediately if the information needed is not readily available.

Step 6: Estimate Waste for Baseline Year

To assess progress in your waste reduction program, it is important to compare the amount of waste you are generating now to the amount of waste generated in your baseline year. You may choose any year as your base year.

If you do not have specific records of the wastes generated for your baseline year, you may consider the following approaches for estimating this information:

1. Your waste hauler and recyclers may be able to provide you with total quantities for your baseline year.
2. If your facility has experienced minimal change since your baseline year, then you can extrapolate the data from current waste generated based on relevant baseline information levels such as number of employees, students, sales, or production data.

Step 7: Complete Waste Audit Summary Sheet

The audit team should maintain a record of the information reviewed, assumptions made, waste samples examined (including the sample dates) and the material weights and/or volumes calculated. Figure 3, Waste Sampling Record, provides a suggested recording format and example. You may find that you need to complete several of these sampling records, one for each operational area, before actually obtaining the total number for your waste audit summary sheet.

Figure 3: IC&I Waste Sampling Record

Location: Material Office Tower - 1 ABC Street			Date: 01/02/3456	
Sample Taken: Office (Admin) waste			Time Period: 5 days, Regular Business	
Operation Characteristics: No unusual business activities				
Material	Characteristics	Volume *	Weight (Kg)	% of Total ** Sample
Cardboard	Clean, no wax	1.5	75	20 %
Fine paper	Includes staples many colours	.75	113	30
Newsprint	Clean	.1	19	5
Aluminum	Mainly from the cafeteria but some from pails at desk	.25	3	1
Ferrous		.5	19	5
Glass		.5	19	5
Residual		1.4	127	34
Totals		5 cu.m.	375 Kg	100 %

* Please note if you measure your waste by volume, you must convert these figures to weights, See Appendix F for Conversion Table.

** If using purchasing records, calculation of % is not applicable.

At this point, you may wish to relate waste generation to a specific indicator, so that changes in production or activity can be accounted for. For example, enrolment in a school may change from one year to the next. By dividing the total waste generated by the number of students, you will arrive at the amount of waste generated per student, per year. Comparing this number with that of other years allows you to observe whether a decrease in overall waste generation is due to declining enrolment or an effective waste reduction workplan.

You are now ready to complete the Waste Audit Summary Sheet, Figure 4 or a similar format, as required by the regulation. This form documents the waste audit report and must be kept on site for five years and made available if requested by a provincial officer.

An annual review of the waste audit must be done and the summary sheet updated as required. A blank audit report form is provided at the end of this guide. Additional forms are available from the ministry's Regional and District Offices.

Ministry of Environment and Energy
Ontario

Figure 4:

Waste Audit Summary
Industrial, Commercial and Institutional Establishments
As required by Ontario Regulation 102

Name of company	Name of contact person	Telephone No.
Material Office Tower	Joe Recycler	(123) 456-7890
Site/location (if applicable)		**Current year**
1 ABC Street, Downtown, Ontario ABC 123		01/02/3456

Type of establishment

☐ Educational Institution	Enrolment:	☐ Manufacturing	Hours:
☐ Restaurant	☐ <$3 million ☐ >$3 million	☒ Office building	Square metres: 15,725 sq. m
☐ Hospital	Class:	☐ Retail shopping establishment/complex	Square metres:
☐ Hotel/Motel	No. of units:		

Material category	Waste generated (tonnes)		Reused material (tonnes)		Recycled material (tonnes)	
	Base year	Current year	Base year	Current year	Base year	Current year
Cardboard		43.2	1	2	15	30
Fine paper		64.8		1	10	43.2
Newspaper		10.8		1		5.4
Aluminum		2.2		0		1.6
Ferrous		10.8		0		8.1
Glass		10.8		1		8.1
Residual	194.4	73.4		0		0
Total	194.4	216.0	1	5	25	96.4

Materials (bought/sold) that contain recycled content	
Material	Percentage of recycled content
Cardboard - packaging material containing recycled content	30%
Fine paper - purchase fine paper with post consumer content	20%

Gross Summary	Base year	Current year	Increase/Decrease (+/-)	%
Waste generated	194.4	216.0	+ 21.6	+ 11%
Less reused	1.0	5.0	+ 4.0	+ 400
Less recycled	25.0	96.4	+ 71.4	+ 285
Equals disposed	168.4	114.6	- 53.8	- 32

I hereby certify that the information provided is complete and correct, and the establishment complies with all the requirements of Regulation 102.

Signature of authorized official	Title	Date
Joe Recycler	President	01/02/3456

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CREATING A WASTE REDUCTION WORKPLAN

Introduction

In the waste audit process you have been studying the waste generated in your establishment and learning more about your waste management policies and operations. Now you will be ready to take action aimed at further waste reduction. Figure 5 gives an overview of a process for creating the waste reduction workplan.

Step 1: Review Current 3Rs Activities

To begin the process, review your Waste Audit Summary Report and assemble information relating to 3Rs actions currently in place, including:

- **waste reduction policies;**
- **current waste reduction, reuse, recycling, and disposal activities;**
- **types and quantities of materials in each activity;**
- **achievement of current waste reduction targets;**
- **operating cost impacts as a result of 3Rs activities.**

Step 2: Identify Areas of Greatest Waste Reduction Impact

A key factor in finding 3Rs opportunities for waste reduction involves examining those materials that make up a large part of the waste produced, usually by weight or volume. Such a move to "organize" your waste audit data will highlight areas where your reduction efforts will have the greatest impact. Waste audit data can be organized in different ways by:

- **weight or volume;**
- **disposal cost;**
- **potential for source separation;**
- **potential to reduce, reuse or recycle;**
- **complexity of handling;**
- **current and potential regulatory requirements.**

Figure 6 shows typical ways to summarize your waste material rankings.

You should also consider issues you may face in implementing 3Rs programs, including the following: health and safety regulations; storage space at your facility; availability of recycling markets and collection services; and operating costs.

Figure 5: Waste Reduction Workplan Summary

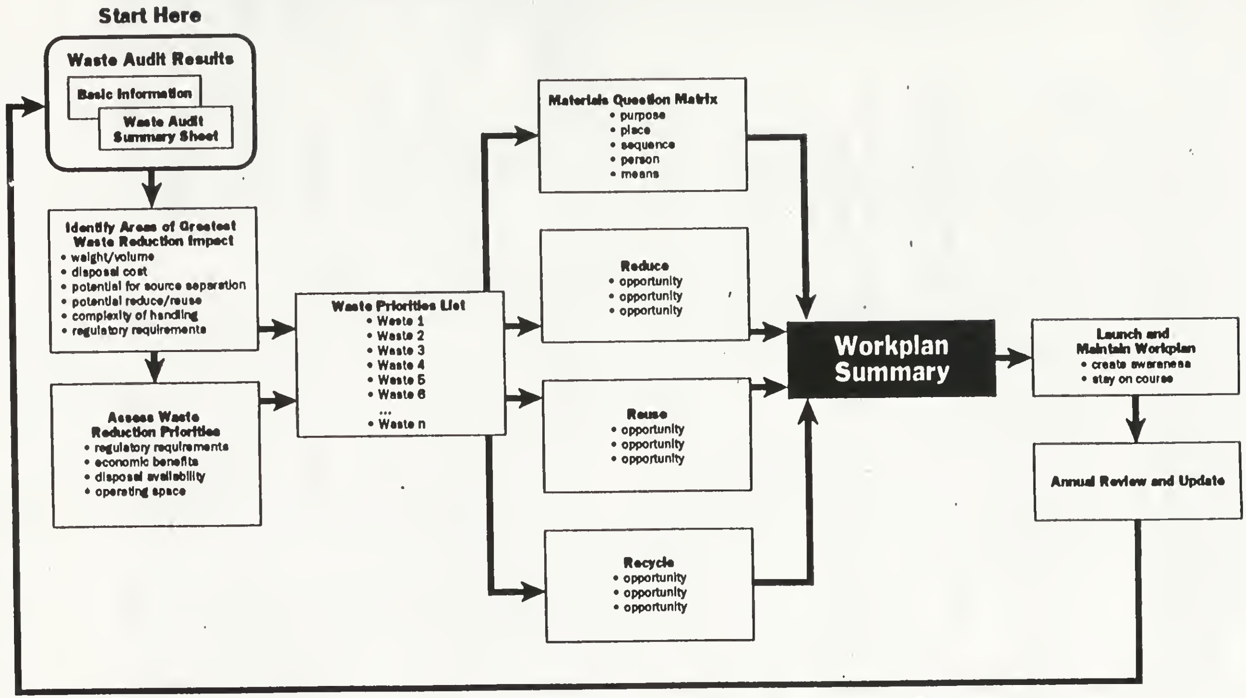


Figure 6: IC&I Organized Waste Audit Data

Waste Material Type	Volume (cu.metre)	Weight	Waste Costs
Cardboard	64.8	43.2	$ 98
Finepaper	32.4	64.8	148
Newsprint	4.3	10.8	6
Aluminum	10.8	2.2	25
Ferrous	21.6	10.8	25
Glass	21.6	10.8	25

Ranking by volume		Ranking by Weight		Ranking by waste cost	
Material Type	Volume (cu.m)	Material Type	Weight (tonnes)	Material Type	Cost $/tonne
Cardboard	64.8	Finepaper	64.8	Finepaper	$ 148
Finepaper	32.4	Cardboard	43.2	Cardboard	98
Ferrous	21.6	Newsprint	10.8	Glass	25
Glass	21.6	Ferrous	10.8	Aluminum	25
Aluminum	10.8	Glass	10.8	Ferrous	25
Newsprint	4.3	Aluminum	2.2	Newsprint	6

Step 3: Assess Waste Reduction Priorities

After identifying general areas for potential waste reduction, you should look at the possible impact of other priorities on your 3Rs options. At this point in your workplan development, you should consider at least the following items:

- **Current and potential regulatory requirements: Check items for reduction, reuse, and recycling limitations (e.g., restrictions on wastes that may be considered "contaminated").**
- **Economic benefits: Review the costs and benefits of each waste reduction opportunity.**
- **Continuing disposal availability: Be aware of planned or anticipated landfill closures or other disposal limitations that may impact on your waste materials.**
- **Changing operating space constraints: Availability of on-site storage space may not continue in the longer term.**

Any other priority influences that relate specifically to your establishment should be factored into your waste reduction decisions (e.g., handling of confidential records).

Step 4: Determine Why Waste Is Generated

In assessing your waste reduction options, you should ask the following basic question at the start "Why is this material being used?" Questions such as this can stimulate thought and help you develop many other ways of dealing with the material under review. A list of suggested questions is shown below.

Purpose	Why is the material being used?	What else could be used?	What should be used ?
Place	Where is it used?	Where else could it be used?	Where should it be used?
Sequence	When is it used?	When could it be used elsewhere?	When should it be used?
Person	Who uses it?	Who else could use it?	Who should use it?
Means	How is it used?	How else could it be used?	How should it be used?

Answers to these questions may show the way to various options for reducing, reusing, and/or recycling your wastes, including:

- **where waste can be reduced by eliminating the use of certain product materials;**
- **where other materials can be used that, in turn, can be reused or recycled;**
- **where less wasteful materials can be used;**
- **where less material can be purchased (e.g. buying in bulk versus individually wrapped items);**
- **where previously recycled materials can be used; and**
- **where controls can be set up to reduce waste generation during your operations.**

Step 5: Identify Opportunities for Reducing, Reusing and Recycling Wastes

By now you will be focused on specific materials in terms of waste reduction opportunities and priorities. Achievement of your waste reduction goals will usually involve the cumulative effect of a number of 3Rs initiatives. This section outlines some 3Rs opportunities which are in common use. Your own situation may differ, however, and not all these possibilities will apply. In many cases the ideas are very simple yet these can often lead to more significant initiatives.

Reducing Wastes

Staff at your facility may already use various methods to reduce the quantity of waste being generated. For example, you may already have replaced some disposable products with either reusable products or disposable products which can be recycled.

You should also take a similar approach for each of the materials you use to support and maintain your various departments. Focus on reducing the quantities of disposable supplies and equipment used.

In administration areas, focus on improving purchasing policies to reduce the amount of incoming packaging , or reducing the quantities of material you use.

Reduce the volumes of paper used. Circulate memos and reports to staff instead of providing a copy to each individual. Remove names from distribution lists if information is no longer needed. Keep memos and letters to one page. Reduce the variation in forms design. Make double-sided photocopies.

Increase the use of electronic communications. Substitute telephone calls or face-to-face conversations for memos and letters. If computers are in common use, encourage the use of voice and electronic mail.

Reduce the volume of disposable packaging. When purchasing supplies, ask for loose items (e.g., pens) rather than those that are individually wrapped. Use permanent instead of disposable tape dispensers.

Reduce the waste potential in bulk purchasing. Assess bulk purchases made to achieve volume discounts. Wastes may result, in the form of obsolete stock materials, if buyers are not aware of planned or anticipated product specification changes.

Do not over-requisition materials. Staff often tend to order more materials than are needed, including allowances for errors. Taking advantage of a bulk purchase to get a volume discount can create waste if material specifications are about to be changed.

Reduce cafeteria waste. Avoid using over-packaged goods in your cafeteria, such as single-serving condiment packages. Also, donate day-old food to food banks.

Reduce customer/employee food waste. In restaurants and cafeterias "leftovers" comprise a large volume of total waste. Review menus, concentrating on portion size, to reduce not only waste but also food costs.

Replace throwaway hand towel dispensers with hand dryers. Hand towel dispensers can sometimes be replaced with electric hand dryers. This may be limited to public areas and selected departments, as hand towels many be more convenient for staff in some departments.

Reduce waste brought in by employees/students. Encourage employees/students to bring lunches in reusable containers or bags.

Consider the following suggestions for manufacturing establishments:

Reduce manufacturing set-up times. Review manufacturing set-ups for potential improvements in procedure to reduce the times involved and thus the wastes produced.

Reduce material content of products. Older product designs may not reflect improved material technologies (e.g., castings, moulds, forgings). Advances in casting technologies can reduce material content. Product light-weighting, where appropriate, can achieve significant economic benefits.

Reduce material allowances in manufacturing. Ensure that you are not providing excessive process start-up and/or cut-off allowances. Older product engineering may not be synchronized with the closer working tolerances of newer technology.

Reduce process waste. Improve process controls to avoid waste in all areas (administration, production, maintenance). Check "actual" set-up and process times taken against "planned" times.

Reusing Wastes

Many waste products in your facility may be reused. As with reduction initiatives, you should seek staff input on every implication of this strategy.

Replace throwaway items with reusable products and materials. Use reusable envelopes for inter-office/faculty/classroom mail. Better still, maximize your use of an electronic mail system.

Increase reuse of cafeteria utensils and equipment. If operating cafeteria services, provide users with reusable or recyclable mugs, dishware, and utensils instead of disposable cups, dishes, and utensils.

Specify reusable packaging. Work out ways to return packaging to suppliers. Let them know you are trying to reduce waste. For example, sturdy corrugated boxes used to package items may be returned for reuse. As part of your purchasing policies, set up distribution systems with your suppliers that make use of reusable/returnable delivery/storage containers. Also talk to your suppliers about possibly replacing throwaway packaging with reusable or recyclable packaging.

Donate/sell reusable items. Equipment and supplies that are no longer required are often attractive to charitable organizations.

Join a food bank. Many food banks welcome donations of consumable fresh goods and out-dated packaged goods. Contact your local social organizations to see if you can help in this way.

Recycling Wastes

For most establishments, opportunities will come from external recycling of wastes. Markets exist for many recyclable materials including: corrugated containers, fine paper, newsprint, glass, aluminum, steel, plastic items and food waste. Others may be added to your recycling list, as the markets develop.

The economics of recycling will vary with the material. For some materials you will receive direct revenue. For others, the cost of recycling may simply be less than the cost of landfill tipping fees.

Establish a recycling program. The Ministry requires that the waste generators identified in this guide have a recycling program in place, see *A Guide to Source Separation of Recyclable Materials for Industrial, Commercial and Institutional Sectors and Multi-Unit Residential Buildings*. Be sure to place well-marked bins for recyclable materials in appropriate locations (e.g., place fine paper recycling bins next to photocopiers).

Provide adequate training. All employees should be provided with training in source-separation methods and supplied with adequate well-labelled containers/storage areas to collect recyclable wastes.

Use products with recycled materials content. Recycling success depends on secure markets for materials. You can help by using or purchasing products with post-consumer recycled content.

Encourage vendors to "take back" recyclables. Suppliers of raw materials or packaging materials may be able to recycle the wastes resulting from your use of their products.

Recycle your own product materials. Where feasible, introduce processes to support internal recycling of waste materials.

Examine composting opportunities. Check with your local municipality or private operators for opportunities to compost organic materials such as food waste, leaf and yard waste, paper towels, and shredded paper.

Contact your local municipality. Contact your local municipal works department to obtain a recycling markets directory and further assistance in your area.

Step 6: Assess Impact of Material Purchasing Practices on Waste Reduction

As indicated, many of your waste reduction opportunities will involve your total material purchasing actions. In some cases, you may develop a purchasing policy to buy materials that already have a recycled content. This action has the added benefit of improving the overall market for recycled materials.

Actions to change the material used to manufacture your products or provide your services may involve discussions with your suppliers. For other products, you can work with your supplier to provide you with more "environmentally sound" materials. Replacing non-recyclable materials with reusable or recyclable materials gives economic benefits as well as greater waste diversion.

Another important waste reduction action with suppliers involves reducing goods packaging and materials containers. Many companies, as part of their purchasing and materials management policies, set up distribution systems with their suppliers to use returnable transportation/storage containers. Working with suppliers, you can eliminate many of the inspection and interim storage processes that require higher material/packaging volumes and the associated administrative paperwork.

On a general basis, you should also review the materials and products currently purchased from your supplier to ensure optimum "environmental friendliness". This will increase your level of reliance on your suppliers to advise you on the availability of previously recycled or more easily recyclable materials for your own use.

Step 7: Complete an Achievable Waste Reduction Workplan

Your waste reduction workplan is a compilation of the waste reduction opportunities you have identified and the actions you intend to take in reducing your wastes. At this stage you should also set waste reduction targets. The provincial target is at least 50 per cent reduction by the year 2000. Ideally, you should attempt to meet if not exceed these targets.

Try to set realistic reduction targets; it is important that your workplan is achievable.

Your targets will form the basis for internal and external waste reduction actions for each waste material. These decisions reflect the benefits of accurate waste audit information. Excessive under-targeting or over-targeting, resulting in missed targets could have negative impacts on your employees' attitudes and confidence in future waste reduction workplans.

Figure 7 shows a completed Waste Reduction Workplan Summary. This form is designed to complement the Waste Audit Summary Report. The workplan focuses on the wastes for which reduction actions have been identified and reduction targets set. The format allows actions on separate waste materials to be identified as well as the total amounts of waste reduced, reused, and recycled.

The Waste Reduction Workplan Summary is a two part form with the general company information at the top and the materials, actions, impacts and dates in the next section. You may find that you need to complete a few of these workplan summaries, should you have a large list of materials. A blank form can be found at the end of this guide.

Ministry of Environment and Energy
Ontario

Figure 7:

Waste Reduction Workplan Summary

As required by Ontario Regulation 102

☒ Industrial, commercial and institutional establishments
☐ Construction and demolition projects

For period: September '94 to September | Year: '95

Shaded areas are for Industrial, Commercial and Institutional Establishments use only.

Name of company: Material Office Tower
Name of contact person: Joe Recycler
Telephone No.: (123) 456-7890
Project site/location: 1 ABC Street, Downtown, Ontario ABC 123
Total waste disposal last year: 194.4 tonnes

Material category	Weight of waste material (tonnes)	Proposed action to divert material	Projections: Reduction (tonnes)	Projections: Reuse (tonnes)	Projections: Recycling (tonnes)	Start date	End date	Status
Cardboard	10.2	Use a reusable container and	3.1			09/94	10/94	complete
		improve present recycling program			1.2	09/94		on-going
Finepaper	21.6	Change photocopier to double sided	4.5			10/94	10/94	complete
		install electronic mail	2.6			01/95	09/95	awaiting funding
		improve present recycling program			12.0			
Newsprint	10.8	improve present recycling program			8.0	09/94	12/94	complete/on-going
Aluminum	2.2	improve present recycling program			2.0	09/94	01/95	on-going
Ferrous	10.8	improve present recycling program			4.5	09/94	12/94	on-going
Glass	10.8	supply staff with mugs	5.2			09/94	10/94	complete
		improve present recycling program			3.1	09/94	12/94	on-going

I hereby certify that the information provided is complete and correct, and the establishment complies with all the requirements of Regulation 102.

Signature of authorized official: Joe Recycler | Title: President | Date: Sept. /94

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LAUNCHING AND MAINTAINING THE WORKPLAN

Creating Awareness

Launching your reduction workplan needs several important actions to ensure success. Most importantly, the regulation requires the owner to implement the waste reduction workplan as updated.

Your Waste Reduction Coordinator/Committee should be clear about the goals and objectives of the workplan. They should assign responsibilities and authorities to appropriate personnel in all administrative, operating and maintenance areas.

It is essential to make the right resources available. This may involve staff time to manage and implement your workplan and basic equipment to contain wastes. Consultation with recyclable materials end users or recycling service providers will help you identify what equipment is needed.

At the same time, your coordinator/committee should develop awareness of your workplan among all staff and employees. Open display of the workplan, as required by the regulation, and explanation of its goals will help secure full participation.

Generate enthusiasm! Be imaginative, create incentives and share the results of your program so that everyone will keep up their support.

Staying on Course

To ensure success, your Coordinator/Committee should monitor waste reduction performance against the targets established. You may find that additional waste reduction opportunities will arise. You may find that more action is needed or different methods become available.

Your Coordinator/Committee should report regularly on your reduction achievements. You may need to adjust operating procedures and amend reduction targets, ideally upwards.

Experiences demonstrated by some establishments show that it is possible to achieve sizable reductions in wastes. The coordinated efforts of all your employees can provide substantial benefits to your own operations and to the environment.

After your first waste audit and workplan, you are required to conduct subsequent annual reviews and keep a report on file. This does not necessarily require you to perform another waste audit/workplan in subsequent years, but to update your latest audit/workplan data with information on activities during the past year.

You should compare your current performance with the previous year to check your reduction achievements against your targets. You can then make changes to your waste diversion targets and planned actions.

APPENDIX F - CONVERSION FACTORS

Metric Conversions

1 Tonne	=	1000 Kilograms	=	2200 lb
1 Kilogram(kg)	=	2.2 pounds (lb)		
1 Cubic Metre(m^3)	=	1.3 cubic yards	=	35.3 ft^3

Typical Container Sizes

Cubic Yard		Cubic Metre
4	=	3.1
6	=	4.6
8	=	6.2
14	=	10.7
20	=	15.4
40	=	30.8

Example Densities

Material	Uncompacted (kg/m^3)	Compacted (kg/m^3)
Aluminum Cans	30-42	256
Ferrous Cans	86	241-288
PET pop bottles	18-24	306
Odd Plastic	30	416
Glass	300-357	595-1189
Corrugated Container	24-27	241-342
Paper:		
Newsprint	214-300	428-600
White Ledger -Flat	223-276	449-550
White Ledger -crumpled	65-122	193
Computer Printout	389	779
Wood:		
sawdust/shavings	288-241	
trimmings	577	
crates	108	
Metal Scrap:		
heavy	2408	
light	803	
Textiles	178	
Mixed Residential Waste	150-300	

Ministry of Environment and Energy / Ministère de l'Environnement et de l'Énergie
Ontario

Waste Audit Summary
Industrial, Commercial and Institutional Establishments
As required by Ontario Regulation 102/94

Sommaire du contrôle de gestion des déchets
Établissements des secteurs industriel, commercial et institutionnel
tel qu'exigé aux termes du Règlement 102/94 de l'Ontario

Name of company / Nom de l'entreprise	Name of contact person / Nom de la personne-ressource	Telephone No. / N° de téléphone

Site/location (if applicable) / Emplacement (s'il y a lieu)	Current year / Année courante

Type of establishment / Type d'établissement

☐ Educational Institution Maison d'enseignement	Enrolment / Effectifs		☐ Manufacturing / Usine	Hours / Heures d'exploitation
☐ Restaurant	☐ <$3 million < 3 000 000 $ ☐ >$3 million > 3 000 000 $		☐ Office building / Immeuble de bureaux	Square metres / Mètres carrés
☐ Hospital / Hôpital	Class / Catégorie		☐ Retail shopping establishment/complex Commerce de détail ou centre commercial	Square metres / Mètres carrés
☐ Hotel/Motel Hôtel ou motel	No. of units / N^bre d'unités			

Material category Type de matière	Waste generated (tonnes) Quantité de déchets produits (en tonnes)		Reused material (tonnes) Quantité de matières réutilisées (en tonnes)		Recycled material (tonnes) Quantité de matières recyclées (en tonnes)	
	Base year Année de référence	Current year Année courante	Base year Année de référence	Current year Année courante	Base year Année de référence	Current year Année courante
Total						

Materials (bought/sold) that contain recycled content / Matières (achetées ou vendues) contenant des matières recyclées	
Material / Matière	Percentage of recycled content Pourcentage de matières recyclées

Gross Summary Sommaire global	Base year Année de référence	Current year Année courante	Increase/Decrease (+/–) Augmentation ou diminution (+/–)	%
Waste generated / Quantité de déchets produits				
Less reused / Moins la quantité de déchets réutilisés				
Less recycled / Moins la quantité de déchets recyclés				
Equals disposed / Égale la quantité de dechets éliminés				

I hereby certify that the information provided is complete and correct, and the establishment complies with all the requirements of Regulation 102/94. / J'atteste par les présentes que les renseignements fournis sont complets et exacts et que l'entreprise satisfait les exigences prévues par le Règlement 102/94.

Signature of authorized official / Signature de la personne autorisée	Title / Titre	Date

WASTE AUDIT SUMMARY INSTRUCTIONS

Industrial, Commercial and Institutional Establishments

Name of Company, Location (if applicable), and Telephone No. - write the name of your company or institution, the address, and the telephone number in the spaces provided.

Current year - write the year in which the audit was performed.

Type of establishment - put a cross in the box next to the type of establishment which is most appropriate, and in the box on the other side, write how your establishment fulfills the given criterion (eg. for an Educational institution, write the enrollment figure).

Material category - write down the type of waste material (eg. fine paper, glass beverage bottles, newspaper, etc...).

Base year - any year previous to the calendar year the audit was performed in for which you have adequate waste generation data (if available).

Waste generated, Reused material, and Recycled material - in these columns, put in the weight in tonnes for each of the materials you listed for your base year and the current year. Waste generated means the total waste generated including waste later reused or recycled. Reused material means waste generated which was reused; recycled material means waste generated that was recycled.

Gross summary - this section is intended to help you calculate how successful your waste reduction activities have been since your base year. Under Base year and Current year, use the data from the Total row in the chart above. Subtract the total reused material and the total recycled material from the total waste generated to find the "Total Disposed Waste". For each row, subtract the figure in the "Base year" column from the figure in the Current year column to find the Increase/Decrease (+/−). Divide the increase or decrease figure by the base year figure then multiply by 100 to find the percent change and write it in the % column.

Have an authorized official of your company sign and date this summary, stating his or her title.

SOMMAIRE DU CONTRÔLE DE GESTION DES DÉCHETS

(Établissements des secteurs industriel, commercial et institutionnel)

Directives

Nom de l'entreprise, emplacement (s'il y a lieu) et numéro de téléphone - Inscrire le nom de l'entreprise ou de l'établissement et le numéro de téléphone dans l'espace réservé à cet effet.

Année courante - Inscrire l'année où le contrôle de gestion des déchets a été effectué.

Type d'établissement - Cocher la case qui correspond le mieux au type d'établissement et, dans l'espace adjacent, décrire en quoi l'entreprise répond aux critères donnés (par exemple, dans le cas d'une maison d'enseignement, préciser le nombre d'étudiants inscrits).

Type de matière - Inscrire le type de déchets (papier fin, bouteilles à jus en verre, journaux, etc.).

Année de référence - Toute année civile au cours de laquelle un contrôle de gestion des déchets a été effectué et pour laquelle on a suffisamment de données.

Déchets produits, matières réutilisées et matières recyclées - Inscrire dans les colonnes appropriées la quantité, exprimée en tonnes, de chacune des matières répertoriées pendant l'année de référence et l'année courante. On entend par déchets produits la quantité totale de déchets produits, y compris les déchets qui seront réutilisés et recyclés. On entend par matières réutilisées les déchets réutilisés; les matières recyclées sont en fait les déchets qui ont été recyclés.

Sommaire global - La présente section vous permettra d'évaluer le rendement de votre plan de réduction des déchets, par rapport à l'année de référence. Inscrire dans les cases **année de référence** et **année courante** le **total** obtenu au tableau précédent. Pour calculer le « total des déchets éliminés », soustraire le total des matières réutilisées et le total des matières recyclées du total des déchets produits. Pour savoir s'il y a eu **augmentation** ou diminution (+/-) de la quantité des déchets, pour chaque rangée, soustraire du nombre de la colonne « année courante » le nombre de la colonne année de référence. Pour calculer le taux de changement, diviser le nombre de la colonne « augmentation ou diminution » par le nombre de la colonne « année de référence » et multiplier le résultat par 100. Inscrire le résultat dans la colonne %.

Faire signer et dater le formulaire par une personne autorisée de votre entreprise en prenant soin d'indiquer son titre.

Ontario — Ministry of Environment and Energy / Ministère de l'Environnement et de l'Énergie

Waste Reduction Workplan Summary

As required by Ontario Regulation 102/94

Sommaire du plan de réduction des déchets

tel qu'exigé aux termes du Règlement 102/94 de l'Ontario

☐ Industrial, commercial and institutional establishments / Établissements des secteurs industriel, commercial et institutionnel

☐ Construction and demolition projects / Projets de construction et de démolition

For period / Période visée — From / Du ____ to / au ____ Year / Année ____

Shaded areas are for Industrial, Commercial and Institutional Establishments use only.
Les sections ombragées sont réservées à l'usage des établissements des secteurs industriel, commercial et institutionnel.

Name of company / Nom de l'entreprise	Name of contact person / Nom de la personne-ressource	Telephone No. / Nº de téléphone

Project site/location / Emplacement du projet	Total waste disposal last year / Quantité totale de déchets éliminés l'année dernière
	tonnes

Material category / Type de matière ou de matériau	Weight of waste material (tonnes) / Quantité de déchets (en tonnes)	Proposed action to divert material / Mesures proposées pour soustraire les matières et les matériaux à l'enfouissement	Projections / Prévisions			Start date / Début	End date / Fin	Status / Progrès réalisés
			Reduction (tonnes) / Réduction (en tonnes)	Reuse (tonnes) / Réutilisation (en tonnes)	Recycling (tonnes) / Recyclage (en tonnes)			

I hereby certify that the information provided is complete and correct, and the establishment complies with all the requirements of Regulation 102/94. / J'atteste par les présentes que les renseignements fournis sont complets et exacts et que l'entreprise satisfait aux exigences prévues par le Règlement 102/94.

Signature of authorized official / Signature de la personne autorisée	Title / Titre	Date

WASTE REDUCTION WORKPLAN SUMMARY INSTRUCTIONS

- In the first section, put a cross in the one box which is most applicable to your company or establishment. Write the period for which the workplan will be in effect.

- **Name of Company, Project site/location (if applicable), and Telephone No.:** write the name of your company or institution, telephone number, and the address of the company or project site in the spaces provided.

- **Total waste disposal last year** - total waste generated in the year previous to the workplan, minus total waste reused and total waste recycled (if any) for that period. Please ensure all figures are in tonnes.

- **Material category** - write down the type of waste material (eg. fine paper, glass beverage bottles, newspaper, concrete, drywall, brick, etc...), and its weight in tonnes. **Proposed Action to Divert Materials** - fill in what action you intend to take to minimize the amount of this material that ends up as waste disposed. Specify this in the next three columns (**Reduction, Reused, Recycled**).

- Shaded areas are for industrial, commercial and institutional establishments use only construction or demoliton projects do not have to complete these sections.

- Have an authorized official of your company sign and date this summary, stating his or her title.

SOMMAIRE DU PLAN DE RÉDUCTION DES DÉCHETS DIRECTIVES

- Dans la première section, cocher la case qui correspond le mieux au type d'entreprise ou d'établissement. Indiquer la période pendant laquelle le plan de réduction sera en vigueur.

- **Nom de l'entreprise, emplacement du projet (s'il y a lieu) et numéro de téléphone** - Inscrire le nom de l'entreprise ou de l'établissement, le numéro de téléphone et l'adresse de l'entreprise ou du lieu dans l'espace réservé à cet effet.

- **Quantité totale de déchets éliminés l'année dernière** - Soustraire de la quantité totale de déchets éliminés l'année précédant le contrôle la quantité totale de déchets réutilisés et de déchets recyclés (s'il y a lieu) durant cette période. Exprimer les résultats en tonnes.

- **Type de matière ou de matériau** - Inscrire le type de déchets (papier fin, bouteilles à jus en verre, journaux, béton, contreplaqué, brique, etc.) et la quantité en tonnes. **Mesures proposées pour soustraire les matières à l'enfouissement** - Décrire les mesures envisagées pour minimiser la quantité de matières destinées à l'enfouissement. Indiquer le poids en tonnes dans l'une des trois colonnes, selon le cas. (**Réduction, Réutilisation, Recyclage**).

- Les sections ombragées sont réservées à l'usage des établissements des secteurs industriel, commercial et institutionnel. Les entreprises de construction ou de démolition n'ont donc pas à remplir ces sections..

- Faire signer et dater le formulaire par une personne autorisée de votre entreprise en prenant soin de préciser son titre.